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RTD UPDATES: Integrated Pest Management

Data updates from the Resources and Technology Division

Economic Research Service
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Pest Management Practices on 1993 Corn, Fall Potatoes, and Soybeans

- Weeds, insects, or diseases were scouted on 45-76% of the 1993 corn acreage, 48-80% of the soybean acreage, and 82-90% of the fall potato acreage in the major growing States.
- Economic thresholds influenced pesticide use on 13-64% of the corn and soybean acreage and 53-86% of the fall potato acreage, depending on the growing States.
- Farmers rotating corn with other crops used insecticides less frequently than did those planting corn two years in succession (11% versus 46% or more).

This issue of **RTD UPDATES** summarizes 1993 pest management practices for the 10 major corn, 8 soybean, and 4 fall potato States. The information can be used to monitor the progress toward adopting pest management practices. The data show the percent of planted acres on which a given pest management practice was used.

Scouting for weeds, insects, or diseases in corn, soybean, and fall potato production was done mainly by the farmer. Fall potato production was scouted more intensely than corn and soybean production because of its high value and many pest problems. Fees paid to crop consultants ranged from \$3.67 per acre for soybeans to \$9.25 for fall potatoes.

Farmers based decisions to use preemergence herbicides mostly on weed problems observed in the field in previous years. In contrast, they based postemergence herbicide use

mostly on the weed species present and the degree of infestation. By scouting and applying postemergence herbicides when the weeds were small, farmers applied herbicides at rates below the recommended rates on over 50% of corn, soybean, and fall potato acreage.

Spot treatments, which also reduce herbicide use, were made on 2-3 percent of the corn and soybean acreage. In addition, cultivation to control weeds was used on 52 percent of the corn, 38 percent of the soybean, and 92 percent of the fall potato acreage.

Farmers rotated crops to break the life cycle of various pests on 50-80% of the acreage. This was especially true for fall potato production. For weed control, crop rotations allow different herbicides to be used over time, broadening the spectrum of control. During a growing season farmers use pesticides with different modes of action to slow the development of pest resistance, especially for insect and disease control in fall potato production.

Insecticide use in corn production is influenced by crop rotation. Corn rootworm larvae become a serious problem when corn is grown continuously in a field for several years. In 1993, 24 percent of the acreage had been in corn for 3 years, and 60 percent was treated with an insecticide. On the other hand, 65 percent of the acreage was in first-year corn, with only 11 percent being treated with an insecticide.

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About RTD UPDATES

RTD UPDATES is a semimonthly series featuring data relating to agricultural resources, the environment, food safety, and technology. These **UPDATES** report recent data from surveys of farm operators and others knowledgeable about changing agricultural resource conditions, with only minimal interpretation or analysis. Please contact the individual listed at the end of the text for additional information about the data in this **UPDATE**. If you would like to be added to the mailing list or have other questions about **RTD UPDATES**, contact Richard Magleby, (202) 219-0436.

Crop rotations and percent of corn acres treated with insecticides

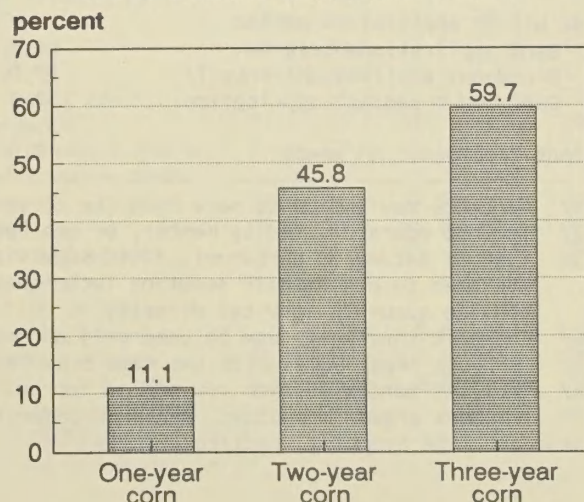


Table 1--Pest and pesticide management practices: Corn, 1993

Practices	IL	IN	IA	MI	MN	MO	NE	OH	SD	WI	Total
----- Million -----											
Planted acres for all purposes	10.5	5.6	12.0	2.5	6.3	2.2	8.0	3.5	3.4	3.4	57.3
Planted acres for grain	10.3	5.3	11.6	2.1	5.7	2.1	7.9	3.2	3.2	3.0	54.3
----- Percent of planted acres for grain -----											
Scouted acres	76.3	63.2	54.9	68.2	74.6	44.5	66.0	69.4	66.7	44.5	64.5
Scouted by 1/ Farmers 2/ Chemical dealer Crop consultant Fieldman (processor) Others 3/	71.3 17.5 1.9 0.0 1.2	58.7 15.4 2.3 0.2 0.7	51.7 5.4 2.2 0.0 0.8	67.4 2.9 3.3 0.0 1.2	72.1 6.2 4.6 0.0 1.4	43.7 0.9 1.8 0.0 0.0	37.8 6.4 29.9 0.9 0.4	64.7 8.7 5.2 0.2 0.9	62.9 4.6 6.4 0.4 0.1	37.1 6.4 5.0 0.7 0.6	57.1 8.8 7.0 0.2 0.9
Crop consultant fee (\$/acre)	4.49	3.14	2.89	1.78	3.64	5.50	5.22	1.63	2.84	4.91	4.51
Economic thresholds used on 4/ Weeds Insects	63.9 41.9	54.5 30.1	42.7 24.5	52.7 22.0	62.4 13.6	39.7 24.0	52.1 43.6	56.2 24.5	61.0 25.0	34.1 12.8	53.0 29.3
Row cultivation to control weeds Trips per cultivated acre (number)	43.1 1.07	34.9 1.17	53.6 1.08	35.9 1.17	65.6 1.28	31.4 1.44	79.0 1.47	22.8 1.19	66.3 1.23	57.5 1.25	52.3 1.23
Crop rotation to control 5/ Insects Weeds	64.9 57.4	59.5 55.2	51.2 49.3	43.0 41.4	60.7 64.7	56.3 66.4	24.2 26.8	56.7 59.0	65.9 75.0	35.6 37.9	51.9 51.6
----- Million -----											
Acres treated with pesticides Herbicides Insecticides	10.2 3.2	5.3 1.4	11.5 3.5	2.0 0.4	5.7 0.5	2.1 0.3	7.7 3.3	3.1 0.6	2.8 0.4	2.8 0.9	53.1 14.4
----- Percent of treated acres -----											
Alternate pesticides to slow development of resistance to Herbicides Insecticides	58.0 52.0	51.4 53.1	47.8 41.4	57.0 59.2	56.7 51.4	44.3 43.8	47.9 49.6	50.1 55.0	63.5 78.1	49.3 62.9	52.3 50.5
Herbicide application timing Preemergence only Weed problems in previous years Field mapping of trouble spots Postemergence only Weed species present Infestation level Reduced rate for small weeds Pre- and postemergence Weed problems in previous years Field mapping of trouble spots Weed species present Infestation level Reduced rate for small weeds	48.2 44.2 12.8 15.8 13.5 12.0 8.5 36.1 32.4 15.2 31.3 28.2 25.4	58.9 56.1 14.6 11.7 10.8 9.9 8.2 29.3 27.2 5.9 27.5 25.4 17.6	39.4 33.6 4.6 20.9 17.2 13.4 10.0 39.7 34.6 10.4 34.6 29.0 22.4	61.6 53.6 5.1 19.4 14.8 11.0 11.8 19.0 14.4 1.3 19.0 13.9 10.6	17.6 15.9 4.5 34.9 34.0 28.1 21.8 47.5 40.5 10.3 44.3 34.2 27.2	75.5 61.1 5.1 12.5 12.0 9.7 6.9 13.0 12.5 1.9 12.0 8.3 8.8	56.1 52.0 6.2 13.9 11.5 11.1 7.1 30.0 27.0 5.1 26.8 21.9 19.3	45.6 42.5 5.1 13.8 11.7 9.2 7.8 40.5 37.1 5.8 36.2 28.4 18.0	18.8 17.1 2.5 29.8 29.0 24.1 9.1 51.4 47.8 13.9 49.4 43.7 29.4	47.0 38.8 3.9 36.7 28.8 21.4 19.9 16.4 15.3 2.9 14.2 11.4 8.5	44.9 40.3 7.3 20.0 17.5 14.6 11.2 35.1 31.3 9.0 31.6 26.5 21.0
Herbicide application method Band applications only 6/ Broadcast applications only 7/ Band and broadcast applications	1.7 97.0 1.3	3.6 95.3 1.1	3.8 89.1 7.1	7.8 87.0 5.2	5.5 83.6 11.0	9.6 89.9 0.5	40.4 50.1 9.5	7.2 90.9 1.9	13.3 72.5 14.2	4.5 93.3 2.1	10.2 84.1 5.7
Spot treatments on weeds	0.0	5.0	1.6	1.7	2.1	0.0	4.5	7.2	2.2	2.2	2.4

1/ Percents may add up to more than the percent scouted due to multiple source scouting.

2/ Include operator, family member, or employee.

3/ Include extension personnel, field supervisors, grower associations, and others. The role of Extension has been to disseminate scouting techniques and to train growers and private consultants rather than provide scouting services directly.

4/ Economic thresholds can be used only on scouted acres.

5/ Excludes those acres with the same crop being planted during the preceeding year.

6/ Includes banded in/over row and in furrow.

7/ Includes ground broadcast, aerial broadcast, chemigation, and directed spray.

Source: USDA Cropping Practices Survey.

Table 2--Crop rotation and insecticide use:
Corn 1993

State/crop system	Percent of acres	Percent treated	Pounds per treated acre
Illinois			
One-year corn 1/	76.5	17.2	0.77
Two-year corn 2/	6.8	65.3	1.14
Three-year corn 3/	16.7	78.3	1.02
Indiana			
One-year corn 1/	66.9	10.3	0.78
Two-year corn 2/	11.5	42.0	0.77
Three-year corn 3/	21.6	53.1	0.82
Iowa			
One-year corn 1/	67.1	9.8	0.98
Two-year corn 2/	13.5	27.6	0.82
Three-year corn 3/	19.4	75.7	0.92
Michigan			
One-year corn 1/	51.0	8.0	0.95
Two-year corn 2/	18.4	22.2	0.97
Three-year corn 3/	30.6	30.7	0.85
Minnesota			
One-year corn 1/	77.4	3.3	0.84
Two-year corn 2/	9.7	9.5	0.89
Three-year corn 3/	12.9	33.9	1.08
Missouri			
One-year corn 1/	84.3	11.9	0.84
Two-year corn 2/	6.1	28.6	0.90
Three-year corn 3/	9.6	27.3	1.15
Nebraska			
One-year corn 1/	33.8	13.6	0.83
Two-year corn 2/	8.2	62.3	1.13
Three-year corn 3/	58.0	64.1	0.85
Ohio			
One-year corn 1/	72.3	12.4	0.95
Two-year corn 2/	14.8	34.9	1.18
Three-year corn 3/	13.0	32.8	1.18
S. Dakota			
One-year corn 1/	80.3	3.8	0.89
Two-year corn 2/	9.5	40.0	0.96
Three-year corn 3/	10.2	40.7	0.66
Wisconsin			
One-year corn 1/	47.8	16.8	0.99
Two-year corn 2/	21.1	36.5	0.97
Three-year corn 3/	31.1	39.8	0.99
All			
One-year corn 1/	65.2	11.1	0.85
Two-year corn 2/	11.0	45.8	0.96
Three-year corn 3/	23.8	59.7	0.91

1/ Corn following a different crop.

2/ Two consecutive years of corn.

3/ Three consecutive years of corn.

Source: USDA Cropping Practices Survey.

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Table 3--Pest and pesticide management practices:
Fall potatoes, 1993

Practices	ID	ME	OR	WA	Total
----- Thousand -----					
Planted acres	390	81	50	145	666
--- Percent of planted acres ---					
Scouted acres	82.8	88.5	83.8	90.5	85.2
Scouted by 1/ Farmers 2/ Chemical dealer Crop consultant Fieldman (processor) Others 3/	76.8 52.0 25.1 22.1 4.0	86.3 11.5 11.5 2.9 24.5	74.6 63.5 11.9 7.5 2.9	73.0 73.0 21.4 44.4 4.0	77.0 52.5 21.6 23.5 6.4
Economic thresholds used on 4/ Weeds Insects Diseases	58.6 64.9 53.5	64.8 82.7 66.2	74.3 77.4 73.1	83.3 85.7 85.7	65.9 72.5 63.5
Row cult. to control weeds Trips per cult. acre (number)	89.2 1.31	92.2 2.60	96.8 1.67	96.0 1.75	91.9 1.60
Crop rotation to control Insects Weeds Diseases Nematodes	69.6 82.0 80.3 60.2	40.3 33.8 41.7 8.6	60.9 83.7 88.1 83.9	73.8 77.0 96.8 82.5	66.3 75.2 80.0 60.6
Soil test for Nematodes Insects Diseases	52.3 19.5 23.7	2.2 7.9 5.8	53.3 16.0 29.1	72.2 23.2 22.2	50.6 18.1 21.6
Crop Consultant fee (\$/acre)	11.37	3.61	3.62	4.73	9.25
----- Thousand -----					
Acres treated with pesticides Herbicides Insecticides Fungicides	356 310 191	71 80 79	38 42 39	122 145 117	587 577 425
--- Percent of treated acres ---					
Alternate pesticides to slow development of resistance to Herbicides Insecticides Fungicides	58.9 61.4 70.3	52.9 78.8 46.7	48.3 72.8 70.3	77.4 90.5 81.4	61.3 71.9 69.0
Herbicide application timing Preemergence only Weed problems in previous years Field mapping of trouble spots Postemergence only Weed species present Infestation level Reduce rate for small weeds Pre- and postemergence Weed problems in previous years Field mapping of trouble spots Weed species present Infestation level Reduce rate for small weeds	68.7 65.7 9.6 10.3 9.0 7.4 7.5 21.0 16.0 6.8 18.6 15.8 15.4	48.6 40.6 6.5 31.9 30.4 29.7 23.2 19.6 17.4 2.2 19.6 18.1 15.2	25.7 22.0 0.0 23.1 17.0 20.0 17.7 51.2 43.6 10.1 39.9 23.6 31.2	28.9 23.1 7.4 22.3 13.2 17.4 14.9 48.8 42.2 10.8 46.3 38.0 46.3	54.6 50.4 8.1 16.5 13.2 13.3 11.8 28.9 23.7 7.3 26.2 21.5 23.2
Herbicide application method Band application only 5/ Broadcast application only 6/ Band and broadcast	2.1 95.1 2.8	1.7 98.4 0.0	0.0 100.0 0.0	0.9 99.1 0.0	1.7 96.7 2.7

See table 1 for footnotes.

Source: USDA Cropping Practices Survey.

Table 4--Pest and pesticide management practices: Soybeans, 1993

Practices	AR	IL	IN	IA	MN	MO	NE	OH	Total
----- Million -----									
Planted acres for all purposes	3.5	9.1	4.9	8.5	5.4	4.2	2.6	4.1	42.3
Planted acres for grain	3.4	8.9	4.8	8.1	5.4	4.1	2.5	4.0	41.3
----- Percent of planted acres for grain -----									
Scouted acres	67.4	78.7	69.5	60.7	80.2	57.4	48.0	76.3	69.2
Scouted by 1/									
Farmers 2/	61.9	73.2	65.1	55.9	79.1	56.0	40.6	72.5	64.9
Chemical dealer	8.8	17.8	17.4	8.6	9.2	2.5	6.1	15.6	11.6
Crop consultant	2.9	2.9	3.2	1.9	4.0	0.4	5.7	1.9	2.7
Fieldman (processor)	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.1
Others 3/	4.5	0.4	1.2	1.0	1.7	0.4	1.8	1.9	1.3
Crop consultant fee (\$/acre)	4.00	3.34	4.08	2.41	4.15	5.00	4.67	2.75	3.67
Economic thresholds used on weeds 4/	55.7	69.9	62.8	50.8	67.1	49.3	38.4	65.8	59.4
Row cultivation to control weeds	56.7	40.8	30.2	40.1	47.3	28.9	37.1	16.7	37.9
Trips per cultivated acre (number)	2.33	1.25	1.33	1.21	1.34	2.11	1.19	1.45	1.47
Crop rotation to control weeds 5/	39.4	71.7	75.2	69.5	79.9	43.9	82.3	58.3	66.6
----- Million -----									
Acres treated with herbicides	3.21	8.81	4.70	7.92	5.39	3.92	2.44	3.90	40.3
----- Percent of treated acres -----									
Alternate herbicides to slow development of resistance	50.2	63.2	57.3	52.7	64.2	37.0	59.8	43.8	54.8
Herbicide application timing									
Preemergence only	26.3	23.2	31.5	24.6	13.7	51.5	48.4	53.9	30.6
Weed problems in previous years	24.6	20.0	30.3	22.2	12.7	45.8	44.8	48.3	27.7
Field mapping of trouble spots	5.8	7.4	8.5	4.4	2.4	6.8	6.4	2.3	5.5
Postemergence only	23.9	39.1	33.9	33.3	40.5	25.4	20.6	18.3	31.8
Weed species present	20.8	36.3	31.5	29.1	39.8	22.0	18.3	16.9	29.2
Infestation level	18.4	32.9	27.3	24.9	35.5	14.4	13.7	14.3	25.1
Reduce rate for small weeds	17.1	25.6	21.8	16.0	20.1	13.3	7.8	7.3	17.8
Pre- and postemergence	49.8	37.7	34.6	42.1	45.8	23.1	31.1	27.8	37.6
Weed problems in previous years	47.8	32.7	33.0	38.2	41.0	22.4	29.7	26.7	34.4
Field mapping of trouble spots	25.3	14.0	12.7	9.9	11.3	2.7	5.0	3.9	11.0
Weed species present	45.7	34.5	33.9	38.7	45.1	22.4	28.2	27.0	35.4
Infestation level	44.4	32.1	31.2	33.3	40.1	17.4	22.8	21.9	31.4
Reduce rate for small weeds	38.9	25.0	27.0	23.2	24.9	7.2	16.4	11.2	22.4
Herbicide application method									
Band application only 6/	11.6	1.0	1.4	4.7	3.1	6.7	12.8	3.3	4.5
Broadcast application only 7/	75.8	94.9	97.7	84.6	87.8	92.2	78.1	95.1	89.2
Band and broadcast application	12.6	4.1	0.9	10.7	9.1	1.1	9.1	1.6	6.4
Spot treatment	2.2	2.2	3.3	3.5	5.8	0.0	1.5	4.4	3.0

See table 1 for footnotes.

Source: USDA Cropping Practices Survey.

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